NTIA Spectrum News

Vol. 3, Issue 1 *Published Aperiodically* Fall, 2001

Office of Spectrum Management

U.S. Department of Commerce • National Telecommunications and Information Administration • Washington, D.C.

WRC-2003 Preparations Off and Running

By Karl Nebbia

One of the final actions of each International Telecommunication Union (ITU) World Radiocommunication Conference (WRC) is to draft the agenda for the following conference. WRC–2000 set forth an optimistic agenda, including 39 separate items in addition to several standing agenda items. Within days of the close of WRC–2000, the work plan had been organized, assigning study responsibilities including creating three new joint task groups, organization of the conference preparatory report, and reconstituting the Special Committee on Regulatory and Procedural Matters.

Three of the regional organizations quickly held meetings to organize work for WRC–2003. These three groups have now appointed chairmen to lead their efforts. We are privileged to have these experienced gentlemen leading the way toward another successful radiocommunication conference. Their challenge is great. We wish them the best in their efforts.

Girouard Leads CITEL

Marc Girouard from Canada has taken the lead for the Inter-American Telecommunications Commission (CITEL). Mr. Girouard holds a Bachelors degree in Electrical Engineering from the University of Ottawa. He is currently Manager, Radio Equipment Standards, in the Spectrum Engineering Branch of Industry Canada, Government of Canada, where he is responsible for the radio standards used to certify radiocommunications equipment in Canada. Mr. Girouard has authored and presented papers on interference analysis to Institute of Electrical and Electronics Engineers conferences. His international activities include contributions to and participation in the ITU Radiocommunication Sector (ITU–R) and CITEL. From 1997 to 2000, he was Vice-Chairman of the CITEL PCC–III working group for the preparation of WRCs.

Rancy Heads CEPT

The chair of the European Conference of Postal and Telecommunications (CEPT) group is François Rancy of France. Mr. Rancy is a graduate of the Ecole Polytechnique (1977) and Ecole Nationale Supérieure des Télécommunications, Paris (1979). Since 1979, he has worked in satellite communications and frequency management at CNET (National Center for Telecommunications studies, research center of France Telecom). In 1988, he became the head of the Radio System Department of the Satellite Communications System Group in CNET where he was responsible for TELECOM 2 system studies, international satellite organizations activities (INTELSAT, INMARSAT, EUTELSAT), TELECOM 1 2 frequency coordination activities, satellite regulatory/standardization activities (ITU–R, European Telecommunications Standards Institute) and frequency activities. In 1990, he began participating in ITU–R Study Groups (SGs) 4 and 10–11. Since 1993, he has led the French preparation for ITU–R study groups and the Radiocommunication Assembly, directly participating in SGs 4 and 10–11. He also

continued on page 4

Victory Appointed NTIA Administrator

President George W. Bush nominated Nancy J. Victory as the new Assistant Secretary of Commerce for Communications and Information, and she was confirmed by the Senate on August 3. The Assistant Secretary becomes the Administrator of the National Telecommunications and Information Administration (NTIA), the President's principal advisor on telecommunications policy, and the manager of the federal government's spectrum.

Prior to her appointment to the Department of Commerce, Assistant Secretary Victory was a partner in the Washington, D.C. law firm of Wiley, Rein & Fielding, where she worked on wireless and satellite issues, including spectrum allocation, licensing, and compliance. She has served as regulatory counsel for numerous transactions, ranging from relatively small asset transfers to some of the largest and most complex industry mergers.

Ms. Victory received her B.A. from Princeton University and her J.D. from the Georgetown University Law Center. She first joined Wiley, Rein & Fielding as an associate in 1989.

"I recognize the critical importance of the spectrum to the nation and to the world," she said on being sworn-in. "We have many spectrum management challenges confronting us, and spectrum management will be a top priority in my administration," she added.

The 3G Spectrum Hunt

By Darlene A. Drazenovich

The ITU describes International Mobile Telecommunications-2000 (IMT–2000) as the global standard for Third Generation (3G) Wireless Communications and the emerging network of the 21st century. IMT–2000 systems are expected to provide access, by means of one or more radio links, to a wide range of telecommunications services supported by the fixed networks and to other services that are specific to mobile users. IMT–2000 is a strategic priority of the ITU, providing a framework for worldwide wireless access by linking the diverse systems of terrestrial and/or satellite based networks. It will exploit the potential synergy between the digital mobile telecommunications technologies and the Fixed Wireless Access/Wireless Access Systems.

Background

The ITU's 1992 World Administrative Radio Conference (WARC–92) identified the 1885–2025 MHz and 2110–2200 MHz bands for countries wishing to implement IMT–2000 services.

Several countries, including the United States, allocated and licensed portions of the bands identified by WARC–92 for Personal Communications Services (PCS) because the success of cellular, as well as the growth of the Internet, stimulated the demand for more spectrum to provide advanced communications applications. However, under the Federal Communications Commission's (FCC) flexible regulatory policy, no regulatory barrier exists to prevent current wireless licensees from evolving their current first and second generation (1G and 2G) systems to 3G in the existing commercial mobile spectrum.

The ITU, after WARC–92, made a forecast that even more spectrum for IMT–2000 would be needed by the year 2010. This issue was on the agenda of the WRC–2000. The conference adopted a flexible, multiple band approach that maintains national prerogatives on making spectrum available for 3G systems while still promoting global/regional roaming and economies of scale. The conference identified the bands 806–960 MHz, 1710–1885 MHz, and 2500–2690 MHz for use by administrations wishing to implement IMT–2000. The following bands were identified for the satellite component: 1525–1544 MHz, 1545–1559 MHz, 1610–1626.5 MHz, 1626.5–1645.5 MHz, 1646.5–1660.5 MHz, 2483.5–2500 MHz, 2500–2520 MHz, and 2670–2690 MHz. Provisions for High Altitude Platform Station operations were adopted in portions of the bands 1885–2025 MHz and 2100–2200 MHz. WRC–2000 also noted in conference resolutions that some administrations plan to use parts of the 698–806 MHz and 2300–2400 MHz bands for IMT–2000.

WARC–92 and WRC–2000 identified a total of 749 MHz for use by administrations wishing to implement the terrestrial component of IMT–2000. Multiple bands were identified for 3G/IMT–2000 systems, recognizing that it would have been very difficult to agree on a single band and that administrations need to balance the spectrum demand for new services with the desire to protect existing services operating in the spectrum. This approach will provide administrations the flexibility needed to tailor their domestic band plans to their specific needs and evolve their 1G and 2G systems to 3G.

U.S. Domestic Process

After WRC–2000, the U.S. Government began a process to identify additional spectrum for advanced mobile communications, including 3G systems such as IMT–2000. This process was necessary because all of the spectrum identified by WARC–92 and WRC–2000 is heavily encumbered in the United States by both commercial and federal government users. The FCC allocates spectrum to broad categories of communications services and not to specific systems such as 3G or IMT–2000. This flexible regulatory approach allows operators to choose the best standards and systems based on their needs and market demands.

Presidential Memorandum on 3G Spectrum

In October 2000, a Presidential Memorandum was issued stating the need and urgency for the United States to select radio frequency spectrum to satisfy the future needs of the citizens and businesses for mobile voice, high-speed data, and Internet-accessible wireless capability. The President directed the Secretary of Commerce to work cooperatively with the FCC to develop a plan to select spectrum for 3G wireless systems and to engage in a discussion with industry to develop recommendations on the identification of this spectrum.

NTIA/FCC Interim Reports

In November 2000, the NTIA and the FCC issued interim reports describing current spectrum uses and the potential for reallocating or sharing the bands identified at WRC–2000. NTIA analyzed the 1755–1850 MHz band that is currently being used by federal government systems, and the FCC analyzed the 2500–2690 MHz band that is used for commercial and academic purposes.

FCC NPRM

The FCC issued a Notice of Proposed Rulemaking (NPRM) in late December 2000, initiating a public proceeding beginning the process of allocating spectrum below 3 GHz for mobile and fixed services to support the introduction of new advanced wireless services, including 3G wireless systems. This proceeding will culminate with the development of service, licensing, and auction rules so that the FCC can auction any additionally allocated spectrum and issue licenses to the auction winners.

Final Reports

In March 2001, the NTIA and the FCC issued final reports describing current spectrum uses and the potential for reallocating or sharing the bands identified at WRC–2000.

The NTIA report documents federal government use of the 1710-1850 MHz band for such systems as: telecommand, telemetry and control of military satellites; military tactical radio relay; government fixed microwave; military test ranges; and naval ship-to-ship and ship-to-shore digital wideband voice and data links. The report concluded that sharing with 3G would be difficult and that, if federal relocation is required, issues involving replacement spectrum, reimbursement, and the time required for federal entities to either modify or replace equipment would need to be addressed. The NTIA indicated that some pairing options are possible if conditions in the National Defense Authorization Act are met and continuity of government operations are maintained. (The law mandates that federal government agencies be reimbursed if required to relocate or modify radio systems to accommodate private sector use of the spectrum. Furthermore, if the spectrum is being used by the Department of Defense, the

continued on Page 4

Ultrawideband and NTIA

By Joseph P. Camacho

The NTIA has been directly involved since 1997 in the issues associated with introducing ultrawideband (UWB) technology on an unlicensed basis into the marketplace. Companies working on UWB want the FCC to allow mass-market sales of their products without requiring individual licenses for each device.

After receiving requests from UWB developers, the FCC issued a notice of inquiry to gather information and investigate the possibility of permitting the operation of UWB radio systems on an unlicensed basis under Part 15 of its rules. The FCC issued a NPRM on a revision of Part 15 rules regarding UWB transmission systems. The key issue for NTIA is the interference potential of unfettered UWB use to critical federal radio systems (air traffic control radionavigation aids, global positioning system (GPS), weather radars, etc.). These systems operate in designated restricted bands previously unavailable for use by unlicensed devices.

What is Ultrawideband?

UWB is an emerging technology using the transmission of very short impulses of radio frequency (RF) energy whose characteristic spectrum signature extends across a very wide range of radio frequencies. One definition is that systems employing these UWB signals often have instantaneous bandwidths of at least 25 percent or more of the center frequency of the device and thereby do not conform to the U.S. frequency allocation table and the associated federal regulations. For example, an UWB system centered on 2 GHz may have an emission bandwidth of 1 GHz, but the energy density is very low. These UWB systems have shown promise in performing a number of useful telecommunications functions, making them very appealing for both commercial and government applications.

UWB technology has been used for ground-penetrating radar for subsurface investigations, detection of buried objects, and for geotechnical studies of underground structures. UWB techniques also are used to determine the level of liquids in large storage tanks. Through-wall UWB imaging systems are another application that would enable police, fire, and rescue personnel to locate persons. Low-cost tools are being developed for home workshops. In the area of communications, UWB technology can be used for short-range broadband wireless networks.

How does Ultrawideband Work?

In the area of emerging technologies, the term "ultrawideband" or UWB signal has come to signify a number of synonymous terms such as impulse, carrier-free, baseband, time domain, nonsinusoidal, and large relative bandwidth radio/radar signals. While traditional wireless devices transmit a continuous wave, an UWB device sends extremely short pulses of data in a binary format. The pulses are sent over a much wider occupied portion of the RF spectrum and are not "locked" on a single discrete frequency.

NTIA's Role

The NTIA is responsible for managing the federal government's use of the RF spectrum. The FCC is responsible for managing the RF spectrum used by the private sector, and state and local governments. In carrying out its responsibilities, the NTIA has undertaken numerous spectrum-related studies to assess spectrum use; studied the feasibility of reallocating spectrum used by the government or relocating government systems; identified existing or potential compatibility problems between systems; provided recommendations for resolving any compatibility conflicts; developed methods to promote the efficient and effective use of the radio spectrum; and improved spectrum management procedures.

Recent NTIA spectrum management efforts include extensive measurements and analyses to assess the interference potential of UWB transmitters to existing and planned federal government systems. Primary attention has been given to safety-of-life and aeronautical radionavigation services, with particular emphasis placed on GPS.

Before the NTIA can accept the operation of UWB devices in restricted bands used by critical federal radio systems, NTIA must assess the potential impact of UWB devices on these systems, as well as develop solutions to any problems identified. Likewise, the FCC must assess the potential impact of UWB devices to non-federal users and their systems that operate in restricted bands. NTIA will coordinate with the FCC on rules for accommodating UWB.

Part 15 Emissions

Part 15 of the FCC rules sets out regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. However, the developer must certify that all equipment conforms to the rules. In the RF spectrum, certain frequency bands are designated as "restricted" because of the critical nature of the operations employing RF systems. Between 335.4–7250 MHz, these federal operations employ aeronautical radionavigation aids, GPS, air traffic control radars, satellite downlinks, aeronautical flight test telemetry, global maritime distress and safety system, etc. The restricted bands in this range are shown below:

Restricted Bands Between 335.4–7250 MHz

399.9–410	2310–2390
608–614	2483.5–2500
960–1240	2655–2900
1300–1427	3260–3267
1435–1626.5	3332–3339
1645.5–1646.5	3345.8–3358
1660–1710	3600–4400
1718.8–1722.2	4500–5150
2200–2300	5350–5460

In restricted frequency bands, only spurious or unintentional emissions at or below a specified field strength are permitted. Below 960 MHz, the unintentional radiation permitted in restricted bands is limited to a field strength of 200 µv/m in a 100 kHz reference bandwidth. UWB transmitters are clearly intentional radiators, and the rule provisions applying to unintentional radiators do not apply to UWB devices. Due to their large bandwidth, UWB devices cannot operate without overlapping many of these restricted bands.

Scope of NTIA Measurements

The NTIA undertook a comprehensive program consisting of measurements, analysis, and simulations to characterize the potential for compatibility between UWB transmissions and selected federal radio systems operating in the restricted frequency bands between 335.4–7250 MHz.

These assessments were performed in two studies: (1) UWB compatibility with GPS

continued on Page 4

continued from page 1

WRC-2003 Preparations

became the head of the Radiocommunications Frequency Bureau, France Télécom (coordination of spectrum issues within the France Télécom Group) and, in 1994, the head of the Radiocommunications and Frequency Management Group (RGF) at CNET. Since 1997, he has been the Director of the Spectrum Planning and International Affairs, Agence Nationale des Fréquences, responsible for the studies relating to technical, economic, and planning concerning the use of frequencies in France and preparation and coordination of the French positions in international fora dealing with frequency spectrum issues. Within CEPT, he has been involved in WRC issues since 1992, vice-chair of the Conference Preparatory Group (CPG) since 1996, chair of Project Team CPG/PT1 in 1996–1997, and chair of project team SE16 since 1993.

Agarwal Chairs APT

R. N. Agarwal of India is the Chairman of the Asia-Pacific Telecommunity (APT) CPG. He graduated from University of Roorkee, India, with a major in telecommunications engineering and joined the Ministry of Communications in 1963. He has served as Senior Expert in Spectrum Management in the ITU. Mr. Agarwal participated in many international conferences and meetings and has been the chairman of various committees of the ITU and APT. He served as chairman of the ITU Special Committee on Radio Regulatory Matters. The ITU awarded Mr. Agarwal the Diploma of Recognition for his outstanding contributions to the ITU–R. Mr. Agarwal is currently the Wireless Adviser to the Government of India, Ministry of Communications in New Delhi and the Head of the Spectrum Management and Radio Regulatory Authority. The 1998 ITU Plenipotentiary Conference elected Mr. Agarwal to the Radio Regulations Board (RRB). He served as President of the RRB in 2000.

continued from page 2

3G Spectrum Hunt

Secretaries of Commerce and Defense and the Chairman of the Joint Chiefs of Staff must jointly certify to certain Congressional committees that alternate bands provide comparable technical characteristics to restore essential military capability.) According to the report, vacating portions of the 1710-1850 MHz band could vary from 9 to 29 years, depending on the system, and assuming that comparable spectrum is available.

Spectrum Allocation Decision

The goal to identify 3G spectrum by the end of July 2001 was delayed. In a June letter to Secretary of Commerce Donald Evans, FCC Chairman Michael Powell stressed that the entire federal government faces a challenging set of issues in addressing how best to make available sufficient spectrum for advanced wireless services. Chairman Powell suggested that the public interest would be best served by allowing for additional time to make informed decisions even if this results in some delay in reaching allocation decisions. He also stated that a revised allocation plan and auction timetable is needed beyond the original auction target date of September 2002. Secretary Evans agreed to extend the efforts to ensure that the final allocation decision is the best possible one. The Secretary directed the NTIA Administrator to work with the FCC on a new plan for the selection of 3G spectrum. An Intra-Government 3G Planning Group, formed under the leadership of the NTIA Administrator, is developing a Spectrum Viability Assessment.

Conclusion

The search to find additional spectrum for 3G in the United States continues . . . .

Find it Via Internet

The President's Memorandum, the plan, interim and final reports, government officials' statements, government-industry briefings on 3G, as well as other related information can be found on the web sites:

www.ntia.doc.gov
www.fcc.gov

continued from page 3

Ultrawideband and NTIA

receivers; and (2) UWB compatibility with selected federal radio systems.

The study for UWB compatibility with GPS receivers used a two-part approach consisting of measurement and analysis components. The measurement plan was published in the *Federal Register* for public comment. Two technical reports were published and are available at the NTIA web site (www.ntia.doc.gov). Two additional reports are near completion.

The study for UWB compatibility with other federal radio systems adopted a plan consisting of three components: measurements, analysis, and simulations to characterize UWB transmission and their potential to interact with federal radio systems. As with the previous study, the measurement plan was also published in the *Federal Register* for public comment. These two technical reports also are available at the NTIA web site. The selected federal radio systems in this assessment study were:

- Distance Measuring Equipment (airborne interrogator and ground transponder)
- Air Traffic Control Radar Beacon System (ground interrogator and airborne transponder)
- Air Route Surveillance Radar
- Search and Rescue Satellite Land User Terminal
- Airport Surveillance Radar
- Next Generation Weather Radar
- Maritime Radionavigation Radar
- Fixed Satellite Service Earth Stations
- Radio Frequency Altimeters
- Microwave Landing System
- Terminal Doppler Weather Radar
- Search and Rescue Satellite Uplink

Based on the results of all the measurements, analyses, and comments in the NPRM, NTIA will coordinate with the FCC on the accommodation of UWB devices.

Software Defined Radio Comes of Age

By Jeffery A. Wepman

Within the past decade, the software defined radio (SDR) technology has moved rapidly from concept to reality. SDRs are currently available for cellular and PCS base stations as well as fixed station military applications. While SDR technology has enabled some practical products, the current implementations suffer from limitations that preclude development of a practical and widely deployed handheld SDR. Challenges including reduction of power consumption, size, weight, and cost remain for implementation of practical handheld SDR devices. However, several SDR experts believe that handheld SDRs will be in widespread use within five years. This prediction is supported by the continuing rapid development of SDRs, driven by tremendous advances in the key components necessary for SDRs. These key components include high-speed, high spurious-free dynamic range analog-to-digital and digital-to-analog converters; high-speed digital signal processing devices such as application specific integrated circuits (ASICs); digital signal processors; field programmable gate arrays (FPGAs); general purpose processors; and wideband linear power amplifiers.

While there are differing opinions as to what an SDR actually is, a good general definition of an SDR is found in the recently adopted American National Standard, *Telecom Glossary 2000*. An SDR consists of a receiver and/or transmitter with the following properties: (a) the received signal is digitized and then processed using software-programmable digital signal processing techniques (digitization may occur at the RF, IF, or baseband); and (b) the modulated signal to be transmitted is generated as a digital signal using software-programmable digital signal processing techniques. The digital signal is then converted to an analog signal for transmission (the conversion to analog may occur at baseband, IF, or RF).

One reason that differing definitions of SDRs exist is that SDRs represent a merging of many divergent fields such as computer science, digital signal processing, digital circuit design, and RF design. Complicating the matter even more, there are many different ways to design an SDR. The primary differences in SDR designs are the digital signal processing platform used which affects the software that needs to be developed, and whether digitization in the receiver and conversion to analog in the transmitter occurs at the RF, IF, or at baseband. The digital signal processing platform can be based on ASICs, digital signal processors, FPGAs, general purpose processors, or any combination of these.

A key factor in SDRs is that software programmability allows easy changes of the radio's fundamental characteristics such as modulation types, operating frequencies, bandwidths, multiple access schemes, source and channel coding/decoding methods, frequency spreading-despreading techniques, and encryption-decryption algorithms. Traditional, hardware-based radios required hardware changes to modify these fundamental characteristics of a radio.

SDRs provide great advantages over traditional radios. Manufacturers could benefit by developing a single SDR platform in which multiple radios can be implemented by loading different software. Because the single SDR would replace multiple hardware radios, a greater economy of scale could be achieved that would drive the cost down. New radios would not have to be designed for the plethora of wireless standards that continue to emerge and all changes could be made in software utilizing a common hardware platform. Interoperability problems experienced by public safety/law enforcement agencies and the military could be eased by SDRs. Users would only have to purchase a single SDR to perform many different radio functions with a change in software.

Growing interest in SDRs in the mid-1990s led to the founding of a major SDR organization in 1996, the SDR Forum, which was originally called the Multimode Multifunction Information Transfer System Forum. The new SDR Forum is a non-profit organization dedicated to promoting the development, deployment, and use of open architectures for advanced wireless systems. Membership in the SDR Forum has been increasing rapidly and now consists of over 120 organizations with international representation from the commercial, government, and academic sectors.

The SDR Forum is comprised of three core committees: the Markets, Technical, and Regulatory Committees. Some key outputs of the Markets Committee are predictions of the SDR market size and business revenue as well as identification of primary market characteristics and drivers for the commercial, military, and civil government sectors. The Technical Committee, subdivided into the Handheld, Base Station, and Mobile Working Groups, promotes the advancement of SDRs by developing open architecture specifications of SDR hardware and software structures. The Regulatory Committee was established to address international regulatory issues for SDRs.

While the ease of changing the SDRs fundamental characteristics holds great advantages for users, it raises a new set of spectrum management and regulatory concerns and challenges. In the United States, both NTIA and the FCC have been monitoring the development of SDRs to assess their impact on regulatory and spectrum management issues. The FCC activity includes a Notice of Inquiry on SDRs issued in March 2000. The FCC requested comments on: 1) the assessment of the state of SDR technology; 2) issues related to approval of SDR hardware and software; 3) the impact of SDRs on spectrum efficiency and sharing; and 4) the potential for improved interoperability using SDRs. In the First Report and Order issued on September 13, 2001, the FCC adopted SDR rules with streamlined equipment authorization procedures. The new rules permit equipment manufacturers to make frequency, modulation, and power changes in SDRs without filing a new equipment authorization application. Electronic labeling is permitted allowing other parties to modify these parameters without requiring the SDR to be returned to the manufacturer for relabeling. No changes were made to the spectrum allocation rules.

Great strides have been made in the development of SDRs, and the spectrum management and regulatory issues are beginning to be addressed. While current and near-term SDR implementations permit easy changes to the radio's fundamental characteristics through software changes, the development of an adaptable SDR that surveys the spectrum and automatically determines what frequency and other types of radio characteristics it should use to communicate is a long-term goal for the future. It is this futuristic type of adaptable SDR that poses the greatest challenge to spectrum managers and regulatory agencies.

SPOTLIGHT ON: Republic of Bulgaria

By Todov Dragostinov

In spectrum management, the Bulgarian Ministry of Transport and Communications is guided, above all, by the economic and political importance of the radio spectrum. The Ministry realizes that the radio spectrum is increasingly becoming a scarce resource making spectrum management crucial. Bulgaria follows the European Commission Green Paper on Radio Spectrum Policy, of December 9, 1998, whose key aspects of spectrum management are:

- Strategic planning of the use of the radio spectrum;
- Harmonization of radio spectrum allocations;
- Radio spectrum assignment and licensing;
- Radio equipment and standards; and
- Institutional framework for frequency coordination.

The Bulgarian Spectrum Management Process

The Bulgarian activities of strategic spectrum planning, allocation, and harmonization to satisfy the spectrum requirements of the civilian sector and the national defense and security fall within the authority of the National Radio Frequency Spectrum Council (NRFSC). The NRFSC was established by the Council of Ministers as a body to exert the State's sovereign rights over the radio frequency spectrum and the geostationary orbital positions, following international agreements. The NRFSC includes two representatives from each of the following departments: State Telecommunications Commission, Ministry of Finance, Ministry of Economy, Ministry of Transport and Communications, Ministry of Defense, and Ministry of Home Affairs. The Chairman of the NRFSC is appointed by the Council of Ministers for a term of four years. The chairman of the NRFSC is Mr. Plamen Petrov, Minister of Transport and Communications.

One important activity of the NRFSC is the development of the National Plan for Frequency Spectrum Allocations. The first National Plan for Frequency Spectrum Allocation for civil and national defense and security needs, as well as for shared use between them, was issued in March 1999. Subsequently, the national plan has been updated four times to accommodate new systems and technologies and to harmonize it with the allocation table of the ITU Radio Regulations. A recent update of the national plan harmonized it with the allocations of the European Conference of the Postal and Telecommunications (CEPT) Administrations and the ITU Radio Regulations following the ITU changes of WRC–2000.

The State Telecommunications Commission regulates and controls the telecommunications activities. It consists of five members, including chairman and deputy chairman. The members of the State Telecommunications Commission are selected by the Council of Ministers and are appointed by the Prime Minister for seven-year terms. The chairman of the State Telecommunications Commission is Mr. Ivan Taushanov.

The individual spectrum users are authorized to provide public services by means of licenses issued by the State Telecommunications Commission. Type approval rules govern the radio equipment that is marketed and used. By the end of 2001, ordinances will be developed on conformity assessment for electromagnetic compatibility and on terminal radio and telecommunications equipment, based on Directive 89/336/EEC and Directive 99/05/EEC, issued by the European Economic Commission.

In its endeavors for coordinated usage of the radio spectrum, the Bulgarian national government adheres to the recommendations of the CEPT and the decisions of the European Radiocommunication Committee (ERC). At the latest WRC–2000, the Bulgarian administration backed nearly all the European Common Proposals on the conference agenda.

Main Spectrum Issues in Bulgaria

Terrestrial mobile and satellite communications are the most dynamically developing sectors of telecommunications. In coordination with the Bulgarian Ministry of Defense, additional GSM cellular frequency bands were released in the 900 MHz and 1800 MHz ranges, and frequency bands were allocated for the needs of various terrestrial and satellite services. A time schedule was prepared for the provision of a frequency resource by 2004 for the needs of the digital cellular mobile networks. The schedule calls for the full release of two 25 MHz segments in the 900 MHz range, and two 75 MHz segments in the 1800 MHz range. This will ensure the licensing of more operators depending on the marketplace needs, with their frequency resources coming from the two frequency ranges. The funding for the refarming of the frequency bands is expected to be redeemed by the initial license fees and the annual fees collected for the use of the frequency resource from the operators.

The total of 230 MHz for the Universal Mobile Telecommunication System (UMTS) or 3G, identified at WARC–92, is not yet released in Bulgaria. Thus, Bulgaria believes that it is too early to plan the release of the additional frequency bands identified by WRC–2000. Planning for additional bands for 3G mobile services will probably not occur until 2006. Bulgaria considers it reasonable to make a time schedule for a phased release of frequency bands for UMTS. As a first priority, Bulgaria believes that a minimum of two 10 MHz frequency blocks in the 1920–1980 MHz and 2110–2170 MHz bands should be found. Additional work is necessary to develop the regulatory framework and the standardization at a European level.

WRC–2000 also adopted the replanning of the broadcasting-satellite service for Regions 1 and 3. Bulgaria is developing a new strategy for the efficient use of the 10 digital satellite channels allocated to Bulgaria at orbital position 1.2 degrees West, together with Cyprus, Greece, and the Vatican City.

Summary

As you can see, Bulgaria has a high priority on bringing its radio spectrum policies and plans in line with Europe and the world. The chances for success in this respect before the year of the planned accession of Bulgaria to the European Union will be greatly enhanced if efficient ways of raising financial resources, both domestic and foreign, are found for the compensation of the frequency refarming.

Published by the National Telecommunications and Information Administration. We would greatly appreciate your comments. Please e-mail or postal mail them to Fred Matos, National Telecommunications and Information Administration, Room 4621, 1401 Constitution Ave. NW, Washington, D.C. 20230; or e-mail to <<fmatos@ntia.doc.gov>>